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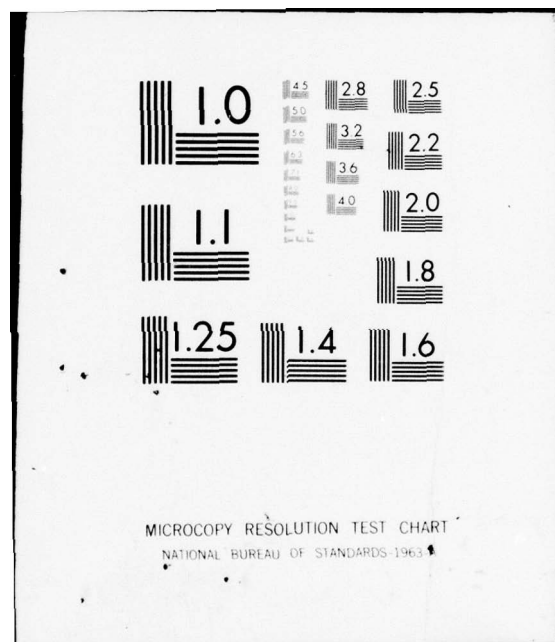
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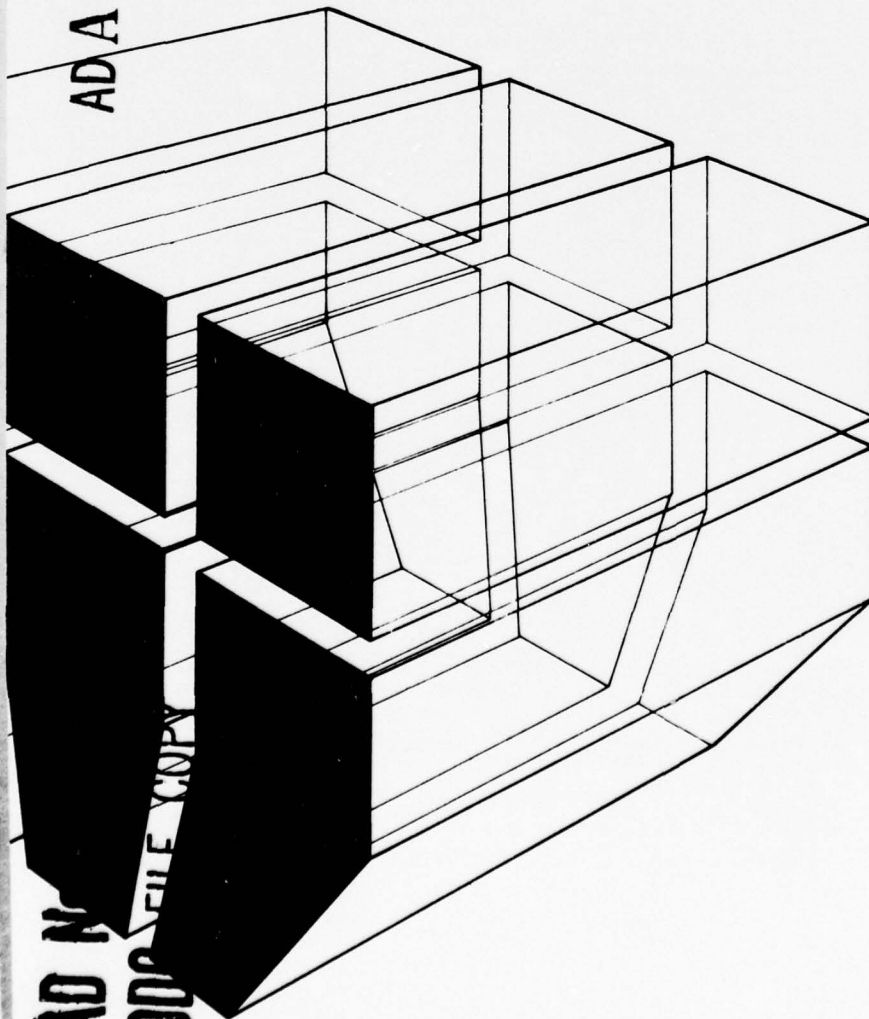
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July 1977

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FIELD PARTICIPATION IN CAEADS

ADA 042665



by
Laurence R. Sadoff



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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This manuscript documents the interaction of the Computer Aided Engineering and Architectural Design System (CAEADS) staff with Corps of Engineers field organizations and describes the active field participation in the CAEADS project. The forms of field/staff interaction and their results to date are discussed. The CAEADS experience described in this report demonstrates the positive benefits of soliciting and incorporating field input into research projects conducted by Corps laboratories.		

FOREWORD

This manuscript was prepared by the CAEADS Management Team of the U.S. Army Construction Engineering Research Laboratory (CERL). The work documented in this report was sponsored by the Directorate of Military Construction, Office of the Chief of Engineers (OCE) under Project 4A763734DT08, "Military Construction and Field Engineering Development"; Task 01, "Computer-Based Procedures"; Work Unit 005, "Computer Assisted Engineering-Architectural Design System Supplement/Subprogram Software." The applicable QCR is 2.10.001. The OCE Technical Monitor is Mr. Vincent Gottschalk.

The work was conducted under the general supervision of Mr. R. A. Larson, Chief of the CAEADS Management Team, and Mr. E. A. Lotz, Assistant Director for Facilities Coordination.

COL J. E. Hays is Commander and Director of CERL, and Dr. L. R. Shaffer is Technical Director.

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PURPOSE

The purpose of this manuscript is twofold:

- a. To document the interaction of the Computer Aided Engineering and Architectural Design System (CAEADS) staff of the U.S. Army Construction Engineering Research Laboratory (CERL) with Corps of Engineers field organizations.
- b. To indicate the active field participation in the CAEADS project.

In addition to illustrating the particular interaction between the CAEADS staff and Corps field organizations, this document also demonstrates the positive benefits of soliciting and incorporating field input into many of the research projects conducted by Corps laboratories.

It should be emphasized that this document is not intended to summarize the total CAEADS efforts during the past 7 months. While the field interaction has been an integral part of the CAEADS team's efforts, it has been only one aspect of CAEADS development. A complete summary of CAEADS development will be presented in a year-end status report. (Status reports are described on p 13.)

CAEADS FIELD USER ADVISORY GROUP

The CAEADS project team was formed in July 1976 as an outgrowth of the old AEADS (Automated Engineering and Architectural Design System) project at CERL. The team has been tasked with developing an integrated set of computerized tools to aid professionals who accomplish military construction (MC) planning and design.

The development plan for the CAEADS project includes the formation of a Field User Advisory Group (FUAG). FUAG's objectives are threefold (see Appendix A for the group's complete charter):

a. To provide a technical channel of communication, coordination, and consultation among organizations involved with MC work and the CERL CAEADS team.

b. To continually review the CAEADS long-term system development plan and recommend priorities for subsystem(s) development.

c. To identify potential applications where computerized solutions should be available and recommend priorities for short-term computerized applications within the Corps.

The FUAG is a continuing body composed of architects and engineers from Corps operating Districts and Divisions and major Army commands (TRADOC and FORSCOM) which are the users of Corps-sponsored construction. Members of the group were appointed based on recommendations of parent organizations involved in MC-type activities. The CAEADS Application Manager serves as Executive Secretary. The group has three types of members:

a. Standing committee members. Selected Districts, Divisions, and major commands have representatives on a standing committee. The represented organizations include South Atlantic Division, Pacific Ocean Division, TRADOC, Baltimore District, Mobile District, Fort Worth District, Sacramento District, and Omaha District.

b. Liaison members. Other Districts, Divisions, and major commands are represented by liaison members.

c. Ex officio members. The CAEADS Project Manager (CERL), CAEADS Technical Monitor from the Office of the Chief of Engineers (OCE), and OCE representatives from the Engineer Information and Data System Office, Research and Development Office, and Directorate of Facilities Engineering have ex officio membership.

The standing committee will meet several times each year to provide guidance on the planning and programming of CAEADS development. The first CAEADS FUAG meeting was held on 25-26 January 1977 at CERL in Champaign, IL. Appendix B contains the agenda of the meeting. Minutes

of the meeting were distributed to activities that have a role or interest in the development of CAEADS.

Liaison members, while not attending the committee meetings, will also provide a channel of technical communication and coordination to the CAEADS development team. The possibility of a meeting of all liaison members sometime in FY 78, after the final report from the architectural/engineering firm under contract to develop a detailed design of an operational CAEADS has been submitted and reviewed, is also being investigated.

VISITATION PROGRAM

Background

An essential part of CAEADS has been the District, Division, and major command visitation program. The proposal for accomplishing these visits was presented and discussed on 14 September 1976 at the OCE-sponsored Design Improvement Conference. Appendix C lists the Districts, Divisions, and major commands visited to date. It should be noted that many of the Divisions had representatives at the District meetings. Thus, there were representatives from the South Atlantic Division at the Savannah and Mobile visits, a representative from the Missouri River Division at the Omaha District presentation, and so on.

Selected District, Division, and major command personnel (design architects, engineers from various disciplines associated with military construction, planners, cost estimators, specification writers, ADP support personnel, et al.) were briefed on CAEADS' long- and short-term planning objectives. The objectives of these briefings were to:

- a. Provide personnel in the field with information on proposed computer-aided techniques and applications for supporting planning and design processes.
- b. Provide a vehicle and opportunity for personnel at the operating level to influence the direction of system development.

Results of the Visitation Program

The benefits of the visitation program have been manifold. The primary benefit has been the development of excellent rapport with the field organizations. They are being consulted and are providing guidance concerning the thrust, definition, development, and implementation of CAEADS. As a result of the visitations and input from the CAEADS FUAG, detailed planning is underway for the development of the "front end" or project definition phase of the military planning cycle. The feasibility of installing computer graphic capabilities at selected test Districts is currently being investigated. Plans are also being developed for the implementation of an on-line computer catalog for use by District ADP offices. These last three actions, which are discussed in more detail in the next three sections of this document, are a direct result of the interaction developed between the CAEADS project team and field organizations.

PROJECT DEFINITION PHASE

Background

A recurrent theme in all the District visits has been the emphasis field personnel place on priorities within CAEADS. Key personnel feel that the master planning part of the MC process (preparation of 1391, Program Development Procedure, etc.) should receive the highest priority and emphasis. This point was reemphasized during the first FUAG meeting.

Actions Taken

Since the FUAG meeting, several events have occurred in response to the input of the field personnel. Detailed planning has begun at CERL, and a comprehensive system development plan for this project definition phase is being generated. Coordination has been initiated with the Fort Worth District, which has begun some independent actions on master planning for some of the installations it serves.

A draft plan was presented to OCE, Fort Worth, and major command personnel at CERL in March 1977. Comments from these parties have been incorporated into an updated draft for presentation/review at the May FUAG meeting.

COMPUTER GRAPHICS

Background

Field personnel suggested that CERL investigate the possibility of employing automated drafting techniques in District offices. Engineer Districts perform varying volumes of design which require production and reproduction of drawings. These drawings cover all phases of design from master planning, to pre-concept (budget drawings), to contract documents (working drawings).

Preliminary Activities

In early December 1976, CERL let a contract to a member of the staff and faculty of the Massachusetts Institute of Technology to investigate the feasibility of this concept. The contractor is visiting selected Districts which are responsible for the production and review of drawings to collect data on the volume of the drafting performed. These data will serve as the basis for making a preliminary judgment as to the feasibility of establishing a test automated drafting station in one of the Districts.

Planned Activities

If it appears that automated drafting stations would be feasible for use in a District, the contractor will develop criteria for procurement of automated drafting systems. These recommendations will include analysis and evaluation of competing systems, including complete automated drafting systems comprising all software/hardware necessary for immediate implementation and use; combinations of existing hardware and software systems from different sources; or software packages compatible with hardware already in use at District offices or soon to become available through projects presently underway at CERL.

Field Implementation

Based on the contractor's recommendations, CERL will attempt to procure a work station for field testing at a Corps District; the specific location of the field test has not yet been determined.

COMPUTER CATALOG

Background

Many computer programs for use in Corps District and Division offices are developed in-house. If there is suitable written documentation for these programs, they are sent to the Waterways Experiment Station (WES) Library. However, the majority of these programs, although used continually within the Districts and Divisions, are not sent to the WES Library due to lack of detailed written documentation. As a result, before someone in a District begins to develop a new in-house program, his/her ADP coordinator must check with other District/Division ADP coordinators as well as the WES Library to determine if a similar program has already been developed. This type of checking is usually done by telephone and is a time-consuming process.

Proposed Plan of Action

As a result of the CAEADS visitation program, it was recommended that an interactive computer catalog be developed which would list all in-house programs developed by Corps District and Division personnel and a point of contact for each. Several key words would be associated with each program so that the ADP coordinator could query the system by program type. An abstract could be included as part of the information, but it would not be required for inclusion in the catalog.

Proposed Use

The catalog would probably reside on some commercial time-sharing system. Each District ADP coordinator would be responsible for entering that District's programs into the system and changing them as appropriate. Thus, ADP coordinators could check to see if specific programs had already been written and could contact the person responsible to get all the documentation for that program. If the documentation was sketchy, then the point of contact would be able to provide information to the proposed user telephonically.

Effect on WES Library

Such a system would in no way replace the WES Library. It would simply organize, speed up, and make more efficient the informal procedures already used by District and Division ADP coordinators.

Status of Catalog

A proposed catalog and its potential uses were demonstrated at the FUAG meeting on 25-26 January 1977. FUAG members agreed that such a

catalog is needed. A representative from the Engineer Data Processing Center (EDPC) who attended the meeting was also enthusiastic about the development of such a catalog and said that EDPC might be interested in doing this work for CERL. Detailed plans for EDPC were discussed by representatives of CERL and EDPC on 2 March 1977. At present, personnel from EDPC and the Engineer Information and Data Systems Office (OCE) are discussing the catalog and how/if it would interface with the WES Library. EDPC is going to provide CERL with an estimate of what developing/implementing such a catalog would cost using existing commercial data base managing and cataloging techniques.

CAEADS STATUS REPORT

Another aspect of CAEADS field interaction has been development of the CAEADS status report. The purpose of these reports is to provide up-to-date information about CAEADS activities underway at CERL. The reports are published periodically for distribution to groups/persons having an interest in CAEADS activities. The first status report was sent to field organizations in early February 1977 (see Appendix D). The second report was published in early April.

SUMMARY

This report had documented the interaction of the CERL CAEADS project staff with Corps Districts and Divisions and major Army commands during the past 7 months. It should be noted that this manuscript has discussed only those interfaces developed by the CAEADS team in the total system development since the present CAEADS team was formed in July 1976. There has been, and continues to be, constant interaction by CERL principal investigators and field organizations on an individual work unit level. This coordination and communication--at both the individual project level and the total system level--is vital to the success of CAEADS.

APPENDIX A
CHARTER OF THE CAEADS
FIELD USER ADVISORY GROUP

Purpose and Scope

This document establishes the charter of the CAEADS Field User Advisory Group including composition, objectives, and responsibilities.

CAEADS Field User Advisory Group Responsibilities

- a. Provide a technical channel of communication, coordination, and consultation among organizations involved with Corps-sponsored construction work and the CERL CAEADS development team.
- b. Continually review the CAEADS long-term system development plan and recommend priorities for subsystem(s) development.
- c. Identify potential applications where computerized solutions should be made available. Recommend priorities for short-term computerized applications within the Corps.

Composition

The CAEADS Field User Advisory Group will be a continuing body composed of carefully selected architects and engineers from Corps of Engineers operating Districts and Divisions and major Army commands (TRADOC and FORSCOM) which are the users of Corps-sponsored construction. The group will function under the direction of the Commander and Director, Construction Engineering Research Laboratory (CERL). Members of the group will be appointed by CERL based upon recommendations received by all Divisions and Districts and major commands involved in Army Military Construction type activities. The CAEADS Application Manager will serve as Executive Secretary. The Group composition will be of three types:

- a. Standing Committee Members: The Districts, Divisions, and major commands listed in Incl 1 will have representatives on a standing committee.
- b. Liaison Members: The Districts, Divisions, and major command listed in Incl 2 will have representatives in the form of liaison members.
- c. Ex Officio Members: The CAEADS Project Manager (CERL), CAEADS Technical Monitor (OCE), a member from the Engineer Information

and Data System Office (OCE), and a member from the Research and Development Office (OCE), will have ex officio membership.

Responsibilities

a. Executive Secretary:

- (1) Furnish summaries of CAEADS development status to all participating organizations (Incl 1 and 2).
- (2) Send out advance notice, agenda, and minutes of all meetings to all Districts, Divisions, and other participating organizations (Incls 1 and 2).
- (3) Record, publish, and distribute minutes of the meetings.
- (4) Call meetings whenever items for consideration warrant such action, but at least once quarterly.

b. Standing Committee Members:

- (1) Attend all CAEADS Field User Advisory Group meetings.
- (2) Provide specific District/Division/major command technical expertise at all Field User Advisory Group meetings.
- (3) Collectively recommend priorities for implementing computer applications of immediate Corps-wide interest.
- (4) Collectively recommend priorities for the development of subsystems within CAEADS.

c. Liaison Members: Provide a channel of technical communication and coordination among organizations involved in military construction work and the CAEADS development team.

d. EIDSO Representative: Monitor Committee activities to insure that they are in concert with Corps-related activities and appropriate authorities.

e. Technical Monitor:

- (1) Insure adequate Division/District representation on the CAEADS Field User Advisory Group 1.
- (2) Provide OCE technical guidance.
- (3) Coordinate appointment of other OCE ex officio members.

f. RDO Representative: Monitor Committee activities and interface with research endeavors within OCE and other appropriate activities.

g. CAEADS Project Manager: Provide CAEADS-related technical expertise and managerial guidance.

General

a. Salaries and all other expenses of Committee members while engaged in Advisory Council activities will be assumed by the home offices. Travel costs will be assumed by CERL.

b. Direct correspondence and communication is authorized and encouraged among Committee members with copies furnished to the Executive Secretary.

c. The Committee may arrange through CAEADS Project Team or through cooperating Corps field operating agencies for engagement of staff assistance, expert services, and consultants.

d. FUAG meetings will normally be attended only by Standing Committee and ex officio members. However, other types of technical experts may be called to specific meetings; their expenses will be covered on a case-by-case basis. Liaison members will not normally attend these meetings.

Standing Committee Members

Baltimore District
Fort Worth District
Mobile District
Omaha District
Pacific Ocean Division
Sacramento District
South Atlantic Division
US Army Training & Doctrine Command (TRADOC)

Liaison Committee Members

Alaska District
European Division
Far East District
Huntsville Division
Japan District
Kansas City District
Middle East Division
Missouri River Division

Liaison Committee Members (cont'd)

New York District
Norfolk District
North Atlantic Division
North Pacific Division
US Army Forces Command (FORSCOM)
Savannah District
South Pacific Division
Southwestern Division

APPENDIX B
CAEADS FIELD USER ADVISORY GROUP STANDING COMMITTEE MEETING
AGENDA
25 January 1977

0830	Welcome	COL Hays
0850	Opening Remarks	Mr. L. Garrett, OCE
0910	Overall Objective & Agenda	CPT Sadoff
0930	CAEADS Overview	Mr. Larson
1020	Coffee Break	
1040	Master Planning (1391, PDB, etc.)	Dr. Stellhorn
1110	Computerized Evaluation of Utility Plans	Dr. Bagby
1130	Lunch	

DESIGN & EVALUATION

1300	Cost Estimating	Mr. O'Connor
1330	Specifications	Dr. Neely
1400	Architectural Criteria	Mr. Dains
1420	Environment	Dr. Jain
1440	Energy	Mr. Hittle
1500	Break	
1515	Hardware	Dr. Stellhorn
1530	System Contract Status	Mr. Lapp
1545	3 D Applications	Dr. Stellhorn
1600	Interface With Other Systems	Mr. Larson
1615	First Day Wrap-Up	CPT Sadoff
1630	Adjourn	
1800	Social Hour	
1900	Dinner	

26 January 1977

0815	TDY Visits to Date	CPT Sadoff
0835	Computerized Graphics	CPT Sadoff
0845	Computerized Catalog	CPT Sadoff Dr. Stelhorn
0925	Long-Term Planning	Mr. Lapp
1000	Break	
1015	Discussion Groups	CPT Sadoff
1200	Lunch	
1245	Discussion Groups	CPT Sadoff
1400	Report: Discussion Group #1	
1420	Break	
1435	Report: Discussion Group #2	
1455	Planning for Next Meeting	CPT Sadoff
1515	Closing	Mr. Larson
1530-1630	Tour of CERL (Optional)	Mr. Marty

APPENDIX C
CAEADS FIELD VISITS

<u>Place</u>	<u>Date</u>	<u>CERL Attendees</u>
Washington, DC - OCE Design Improvement Conference	14-17 Sept 76	Mr. Ray Larson Mr. Michael O'Connor Mr. Dale Bryant CPT Laurence Sadoff (part time)
Savannah District	13 Oct 76	Mr. Ray Larson CPT Laurence Sadoff
Mobile District	14 Oct 76	Mr. Ray Larson CPT Laurence Sadoff
Omaha District	20 Oct 76	Mr. Ray Larson CPT Laurence Sadoff
Fort Worth District	5 Nov 76	Mr. Ray Larson CPT Laurence Sadoff
Sacramento District	10 Nov 76	Mr. Ray Larson CPT Laurence Sadoff
Baltimore District	17 Nov 76	Mr. Ray Larson CPT Laurence Sadoff
Kansas City District	4 Jan 77	CPT Laurence Sadoff Dr. William Stellhorn
TRADOC	11 Jan 77	CPT Laurence Sadoff
Norfolk District	12 Jan 77	CPT Laurence Sadoff Mr. Roger Lapp
Pacific Ocean Division	14-15 Feb 77	CPT Laurence Sadoff
New York District	24 Feb 77	Mr. Ray Larson CPT Laurence Sadoff
FORSCOM	15 Mar 77	CPT Laurence Sadoff Dr. Seung-Jai Kim
Huntsville Division	16 Mar 77	CPT Laurence Sadoff Dr. Seung-Jai Kim

APPENDIX D
FIRST CAEADS STATUS REPORT

MEMORANDUM FOR RECORD

SUBJECT: CAEADS Status Report

1 General

A. The purpose of this status report is to provide up to date information about the OCE sponsored project for developing a Computer Aided Engineering and Architectural Design System (CAEADS) which is being undertaken by CERL. This report will be published periodically and will be distributed to groups/persons having an interest in CAEADS activities.

B. In July 1976 the current CAEADS project team was formed at CERL. CAEADS is an outgrowth of the former Automated Engineering and Architectural Design System (AEADS) project. Mr. Raymond Larson was assigned as CAEADS Project Manager on 9 July 1976. The CAEADS project team has since evolved into a structure that includes three specialized managers. Captain Laurence Sadoff occupies the positions of Deputy Manager and Applications Manager. Dr. William Stellhorn is the Implementation Manager. The Systems Manager is Mr. Roger Lapp. The project team is presently placing emphasis on detailed long term planning for a CAEADS as well as evaluation of current Corps/commercial automated applications for both short and long term implementation.

2 CAEADS Contracts

On 24 December 1976 a contract was awarded to Daniel, Mann, Johnson, and Mendenhall (DMJM), a Los Angeles Architect/Engineer firm, for a detailed design of an operational Computer Aided Engineering and Architectural Design System (CAEADS). Tasks included in this contract are the description of the current and proposed systems, organizational structure, operational support

limits, interfaces with other systems, system and workload data, performance requirements, backup and flexibility requirements, test-installation-conversion concepts, and communication requirements. Work under this contract will be in detail sufficient to define initial hardware and software specification/development/acquisition. Limited detail will be provided on description of hierarchical structure, system functions, input and output, information elements, and data base, with flow and functional logic charts, glossary, alternate concepts evaluations, and an action plan. The contract runs eight active months, with draft reports due 31 January 1977, 30 April 1977, and 31 August 1977.

Supporting the DMJM contract are two other contracts, an assignment to another agency, and CERL in-house work, the result of which supporting work will be integrated into the overall system design by DMJM. One contract, with Applied Research of Cambridge (Canada), Ltd. to run five months, beginning 10 January 1977, will provide an analysis and recommendations on a file structure for computerized representation of 3-dimensional structures. The other contract, with Mr. Guy Weinzapfel, to run three and one half months, beginning 7 December 1977, provides an investigation of Corps of Engineers needs for automated drafting systems. An assignment to the Federal Computer Performance Evaluation and Simulation Center (FEDSIM, U.S. Air Force), to run six months, beginning 1 February 1977, will provide recommendations for computer hardware and communications configurations, with costs analyses, using system workload data provided by DMJM.

3 Field User Advisory Group

The development plan for the CAEADS project includes the formation of a Field User Advisory Group. The objectives of the Group are threefold:

- (1) To provide a technical channel of communication, coordination and consultation among organizations involved with MC work and the CERL CAEADS team.
- (2) To continually review the CAEADS long term system development plan and recommend priorities for subsystem(s) development.

(3) To identify potential applications where computerized solutions should be available and to recommend priorities for short term computerized applications within the Corps.

The CAEADS Field User Advisory Group will be a continuing body composed of architects and engineers from Corps of Engineers operating Districts and Divisions and major Army commands (TRADOC and FORSCOM) which are the users of Corps sponsored construction. Members of the group will be appointed based upon recommendations of parent organizations involved in MC type activities. The CAEADS Application Manager will serve as Executive Secretary. The Group composition will be of three types:

(1) Standing Committee Members: Selected Districts, Divisions, and major commands will have representatives on a standing committee. The represented organizations include: South Atlantic Division (SAD), Pacific Ocean Division (POD), TRADOC, Baltimore District (NAB), Mobile District (SAM), Fort Worth District (SWF), Sacramento District (SPK), and the Omaha District (MRO).

(2) Liaison Members: Other Districts, Divisions, and major commands will have representatives in the form of liaison members.

(3) Ex Officio Members: The CAEADS Project Manager (CERL), CAEADS Technical Monitor (OCE), a member from the Engineer Information and Data System Office (OCE), a member from the Research and Development Office (OCE) and a member from the FE Directorate (OCE), will have ex officio membership.

The standing committee will meet several times throughout the year to provide guidance on the planning and programming of CAEADS development. Liaison members, while not attending the committee meetings, will also provide a channel of technical communication and coordination to the CAEADS development team.

The first CAEADS Field User Advisory Group meeting was held on 25 and 26 January 1977 at CERL in Champaign, Illinois. Minutes of this meeting will be distributed to activities that have a role or interest in the development of CAEADS.

4 District Visits

CAEADS personnel are visiting all Districts which accomplish military construction. The objectives of these visits are to provide personnel at the District level with information on proposed computer aided techniques and applications for supporting planning and design processes and to provide a vehicle and opportunity for personnel at the operating level to influence the direction that system development takes.

Suggestions have been received concerning short term efforts. As a result an investigation has been initiated to evaluate the feasibility of automated drafting stations within Districts. In addition development of an on line computerized catalog of in house District developed computer programs is also being evaluated.

5 Miscellaneous

Comments concerning items in this status report should be addressed to Ms. Cheryl Winget, CERL-ZCA.

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